WO 2004/113273 PCT/EP2004/006749

- 73 -

What is claimed is:

1. A compound of formula

$$\begin{array}{c}
M \\
A_0 \\
\end{array}$$

$$\begin{array}{c}
(R_4)_k \\
A_1 \\
\end{array}$$

$$\begin{array}{c}
R_1 \\
\end{array}$$

$$\begin{array}{c}
(R_3)_m \\
X_2 \\
\end{array}$$

$$\begin{array}{c}
X_1 \\
X_2
\end{array}$$

$$\begin{array}{c}
X_1 \\
X_2$$

$$\begin{array}{c}
X_1 \\
X_2
\end{array}$$

$$\begin{array}{c}
X_1 \\
X_2$$

$$\begin{array}{c}
X_1 \\
X_2
\end{array}$$

$$\begin{array}{c}
X_1 \\
X_2$$

$$\begin{array}{c}
X_1 \\
X_2
\end{array}$$

$$\begin{array}{c}
X_1 \\
X_2$$

wherein

 A_0 , A_1 and A_2 are each independently of the others a bond or a C_1 - C_6 alkylene bridge which is unsubstituted or substituted by from one to six identical or different substituents selected from halogen and C_3 - C_8 cycloalkyl;

 A_3 is a C_1 - C_6 alkylene bridge which is unsubstituted or substituted by from one to six identical or different substituents selected from halogen and C_3 - C_8 cycloalkyl;

Y is O, NR₁₁, S, SO or SO₂;

M is O or NOR_{8.}

X₁ and X₂ are each independently of the other fluorine, chlorine or bromine;

 R_1 , R_2 and R_3 are each independently of the others H, halogen, OH, SH, CN, nitro, C_1 - C_6 alkyl, C_1 - C_6 haloalkyl, C_1 - C_6 alkylcarbonyl, C_2 - C_6 alkenyl, C_2 - C_6 haloalkenyl, C_2 - C_6 alkynyl, C_1 - C_6 alkoxy, C_1 - C_6 alkoxy, C_2 - C_6 alkenyloxy, C_2 - C_6 alkenyloxy, C_2 - C_6 alkyl, C_1 - C_6 alkoxycarbonyl or C_3 - C_6 haloalkynyloxy; the substituents R_3 being independent of one another when m is 2;

Q is O, NR₁₁, S, SO or SO₂;

W is O, NR₁₁, S, SO, SO₂, -C(=O)-O-, -O-C(=O)-, -C(=O)-NR₁₁- or -NR₁₁-C(=O)-;

T is a bond, O, NR₁₁, S, SO, SO₂, -C(=O)-O-, -O-C(=O)-, -C(=O)-NR₁₁- or -NR₁₁-C(=O)-;

D is CH or N;

 R_4 is H, halogen, OH, SH, CN, nitro, C_1 - C_6 alkyl, C_1 - C_6 haloalkyl, C_1 - C_6 alkylcarbonyl, C_2 - C_6 alkenyl, C_2 - C_6 alkenyl, C_1 - C_6 alkoxy, C_1 - C_6 haloalkoxy, C_2 - C_6 alkynyloxy, C_2 - C_6 alkynyloxy, C_2 - C_6 alkynyloxy, C_3 - C_6 alkyl, C_1 - C_6 - C_6 alkyl, C_1 - C_6 -

alkoxycarbonyl, C_3 - C_6 haloalkynyloxy, NH_2 , $NH(C_1$ - C_6 alkyl) or $N(C_1$ - C_6 alkyl) $_2$ wherein the two alkyl groups are independent of one another; the substituents R_4 being independent of one another when k is greater than 1;

 R_5 is C_1 - C_{12} alkyl substituted by from one to five substituents selected from the group consisting of -N₃, NO₂, OH, C₃-C₈cycloalkyl, C₃-C₈cycloalkoxy, C₁-C₆alkoxy, C₁-C₆haloalkoxy, C₂-C₆haloalkenyloxy, C₃-C₆haloalkynyloxy, C₃-C₆haloalkynyl, C₃-C₆haloalkynyloxy, C₃-C₈cycloalkyl-C₁-C₆alkoxy, C₁-C₆alkylcarbonyl, C₁-C₆haloalkylcarbonyl, C₁-C₆alkoxy-C₁-C₆alkoxy, -P(=O)(OC₁-C₆alkyl)₂, -S(O)_q-R₁₃, NH₂, NH(C₁-C₆alkyl),N(C₁-C₆alkyl)₂ wherein the two alkyl groups are independent of one another, -N(R₇)₂ wherein the two R₇s are independent of one another and -NR₁₄S(O)qR₁₅;

 C_3 - C_8 cycloalkyl substituted by from one to five identical or different substituents selected from the group consisting of C_1 - C_6 alkyl, halogen, CN, NO₂, OH, C_1 - C_6 alkoxy, C_1 - C_6 haloalkoxy, NH₂, NH(C_1 - C_6 alkyl) and N(C_1 - C_6 alkyl)₂ wherein the two alkyl groups are independent of one another;

-N(R₇)₂ wherein the two R₇s are independent of one another;

 $-C(=O)-O-R_8; -C(=O)-R_9; -C(=O)-NH-R_9; -C(=N-O-R_9)R_{10}; -C(=N-NH-R_9)R_{10}; \\ C_2-C_6 alkenyl; C_2-C_6 alkynyl; heterocyclyl; or$

-NR₁₄S(O)qR₁₅

wherein the alkenyl and alkynyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five identical or different substituents selected from the group consisting of halogen, -N₃, CN, NO₂, OH, C₃-C₈cycloalkyl, C₁-C₆-alkoxy, C₁-C₆haloalkoxy, C₂-C₆alkenyloxy, C₂-C₆haloalkenyloxy, C₃-C₆alkynyloxy, C₃-C₆haloalkynyloxy, C₃-C₈cycloalkyl-C₁-C₆alkoxy, C₁-C₆alkylcarbonyl, C₁-C₆haloalkylcarbonyl, C₁-C₆alkoxycarbonyl, C₁-C₆alkylcarbonyl-C₁-C₆alkyl, C₁-C₆alkyl, C₁-C₆alkyl, C₁-C₆alkyl, C₁-C₆alkyl, C₂-C₆alkenyloxy-C₁-C₆alkyl, C₁-C₆alkyl, C₂-C₆alkenyloxy-C₁-C₆alkyl, C₃-C₆alkyl, C₂-C₆alkyl, -P(=O)(OC₁-C₆alkyl)₂, -S(O)_q-R₁₃, NH₂, NH(C₁-C₆alkyl) and N(C₁-C₆alkyl)₂, wherein the two alkyl groups are independent of one another;

and wherein the heterocyclyl radical mentioned under R_5 are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five substituents selected from halogen, CN, NO₂, OH, SH, C₁-C₆alkyl, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₃-C₆alkynyl, C₃-C₈cycloalkyl, C₃-C₆cycloalkyl-C₁-C₆alkyl, C₁-C₆alkoxy,

 C_1 - C_6 haloalkoxy, C_2 - C_6 alkenyloxy, C_2 - C_6 haloalkenyloxy, C_3 - C_6 alkynyloxy, C_3 - C_6 haloalkynyloxy, C_3 - C_8 cycloalkyl- C_1 - C_6 alkoxy, C_1 - C_6 alkylcarbonyl, C_1 - C_6 haloalkylcarbonyl, C_1 - C_6 alkoxycarbonyl, C_1 - C_6 alkylcarbonyl- C_1 - C_6 alkyl, C_1 - C_6 alkoxycarbonyl- C_1 - C_6 alkyl, C_1 - C_6 alkylthio, C_2 - C_6 alkenylthio, C_3 - C_6 alkynylthio, C_3 - C_6 cycloalkyl- C_1 - C_6 alkylthio, C_3 - C_6 haloalkynyl, $C_2\text{-}C_6\text{haloalkenylthio, }C_1\text{-}C_6\text{haloalkylthio, }C_1\text{-}C_6\text{alkoxy-}C_1\text{-}C_6\text{alkyl, }C_1\text{-}C_6\text{haloalkoxy-}C_1\text{-}C_6\text{alkyl, }C_2\text{-}C_6\text{haloalkenylthio, }C_1\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkylthio, }C_2\text{-}C_6\text{haloalkylthio, }C_2\text{-}C_6\text{haloalkenylthio, }C_2\text{-}C_6\text{haloalkylthio, }C_2\text{ C_2-C_6 \\ alkenyloxy-C_1-C_6 \\ alkyl, \ C_2-C_6 \\ haloalkenyloxy-C_1-C_6 \\ alkyl, \ C_3-C_6 \\ alkynyloxy-C_1-C_6 \\ alkyl, \ C_3-C_6 \\ alkyl, \ C_3-C_6 \\ alkynyloxy-C_1-C_6 \\ alkyl, \ C_3-C_6 \\$ NH_2 , $NH(C_1-C_6alkyl)$, $N(C_1-C_6alkyl)_2$ wherein the two alkyl groups are independent of one another, C_1 - C_6 alkylcarbonylamino, C_1 - C_6 haloalkylcarbonylamino, C_1 - C_6 alkoxycarbonylamino and C₁-C₆alkylaminocarbonylamino;

or, when A_0 is a C_1 - C_6 alkylene bridge, R_5 is C_2 - C_6 alkylene bonded to one of the carbon atoms of A_0 :

or, when R_4 and a group $-C(=NOR_6)R_5$ are in the ortho-position relative to one another, R₄ and R₅ together form a C₂-C₆alkylene bridge wherein one or two CH₂ groups each independently of the other may be replaced by O, NR₁₂, S or SO, and wherein the CH₂ groups are unsubstituted or mono- or di-substituted by halogen, OH, SH, CN, nitro, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy or C₁-C₆haloalkoxy;

is H, C_1 - C_{12} alkyl, C_3 - C_8 cycloalkyl, C_1 - C_6 alkylcarbonyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, R₆ aryl, heterocyclyl or benzyl, wherein the alkyl, cycloalkyl, alkenyl and alkynyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five identical or different substituents selected from the group consisting of halogen, -N₃, CN, NO₂, OH, SH, C₁-C₆alkoxy, C₁-C₆haloalkoxy, C₂-C₆alkenyloxy, C₂-C₆haloalkenyloxy, $C_3-C_6 alkynyloxy,\ C_3-C_6 haloalkynyloxy,\ C_3-C_8 cycloalkyl-C_1-C_6 alkoxy,\ C_1-C_6 alkylcarbonyl,$ C_1 - C_6 haloalkylcarbonyl, C_1 - C_6 alkoxycarbonyl, C_1 - C_6 alkylcarbonyl- C_1 - C_6 alkyl, C_1 - C_6 alkoxycarbonyl-C₁-C₆alkyl, C₁-C₆alkylthio, C₂-C₆alkenylthio, C₃-C₆alkynylthio, C₃-C₆cycloalkyl- C_1 - C_6 alkylthio, C_3 - C_6 haloalkynyl, C_2 - C_6 haloalkenylthio, C_1 - C_6 haloalkylthio, C_1 - C_6 alkoxy- $C_1-C_6 alkyl,\ C_1-C_6 alkyl,\ C_2-C_6 alkenyloxy-C_1-C_6 alkyl,\ C_2-C_6 alkyl,\ C_2-C_6 alkyl,\ C_3-C_6 a$ C_1 - C_6 alkyl, C_3 - C_6 alkynyloxy- C_1 - C_6 alkyl, NH_2 , $NH(C_1$ - C_6 alkyl), $N(C_1$ - C_6 alkyl) $_2$ wherein the two alkyl groups are independent of one another, C1-Cealkylcarbonylamino, C_1 - C_6 haloalkylcarbonylamino, C_1 - C_6 alkoxycarbonylamino and C_1 - C_6 alkylaminocarbonylamino;

and the aryl, heterocyclyl and benzyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five identical or different substituents selected from the group consisting of halogen, CN, NO₂, OH, SH, C₁-C₆alkyl, C₁-C₆haloalkyl, $C_2-C_6 \text{alkenyl}, \ C_2-C_6 \text{haloalkenyl}, \ C_3-C_6 \text{alkynyl}, \ C_3-C_8 \text{cycloalkyl}, \ C_3-C_8 \text{cycloalkyl-} C_1-C_6 \text{alkyl}, \ C_1-C_6 \text{alkoxy}, \ C_1-C_6 \text{haloalkoxy}, \ C_2-C_6 \text{alkenyloxy}, \ C_2-C_6 \text{haloalkenyloxy}, \ C_3-C_6 \text{alkynyloxy}, \ C_3-C_6 \text{alkynyloxy}, \ C_3-C_6 \text{alkyloarbonyl}, \ C_1-C_6 \text{alkyloarbonyl}, \ C_1-C_6 \text{alkyloarbonyl}, \ C_1-C_6 \text{alkyloarbonyl-} C_1-C_6$

 $R_7 \quad \text{is H, C}_1\text{-C}_6\text{alkyl, C}_1\text{-C}_3\text{haloalkyl, C}_1\text{-C}_6\text{alkylcarbonyl, C}_1\text{-C}_3\text{haloalkylcarbonyl, C}_1\text{-C}_6\text{alkoxycarbonyl, C}_3\text{-C}_8\text{cycloalkyl, C}_3\text{-C}_8\text{ cycloalkylcarbonyl or formyl;}$

R₈ is H, C₁-C₁₂alkyl substituted by from one to five identical or different substituents selected from halogen, -N₃, CN, NO₂, OH, C₁-C₆alkoxy, C₁-C₆alkylthio, NH₂, NH(C₁-C₆alkyl), N(C₁-C₆alkyl)₂ wherein the two alkyl groups are independent of one another and C₁-C₆alkylcarbonylamino; C₃-C₈cycloalkyl, C₁-C₆alkylcarbonyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₂-C₆alkynyl, C₂-C₆haloalkynyl, aryl, heterocyclyl or benzyl, wherein the aryl, heterocyclyl and benzyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five substituents selected from the group consisting of halogen, CN, NO₂, OH, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₃-C₆-alkynyl, C₃-C₈cycloalkyl, C₁-C₆alkoxy, C₁-C₆haloalkoxy, C₂-C₆alkenyloxy, C₂-C₆haloalkenyloxy, C₃-C₆haloalkynyloxy, C₃-C₆haloalkynyloxy, C₁-C₆alkylcarbonyl, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylthio, C₁-C₆alkylcarbonylamino, C₁-C₆alkylcarbonylamino, C₁-C₆alkylcarbonylamino, C₁-C₆alkylcarbonylamino, C₁-C₆alkylcarbonylamino, C₁-C₆alkylcarbonylamino, C₁-C₆alkylaminocarbonylamino;

 R_9 is H, C_1 - C_{12} alkyl unsubstituted or substituted by from one to five identical or different substituents selected from halogen, CN, NO₂, OH, C_1 - C_6 alkoxy, C_1 - C_6 alkylthio, NH₂, NH(C_1 - C_6 alkyl), N(C_1 - C_6 alkyl)₂ wherein the two alkyl groups are independent of one another and C_1 - C_6 alkylcarbonylamino; C_3 - C_6 cycloalkyl, C_1 - C_6 alkylcarbonyl, C_2 - C_6 alkenyl, C_2 - C_6 haloalkynyl, aryl, heterocyclyl or benzyl, wherein the aryl, heterocyclyl and benzyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five substituents selected from the group consisting

of halogen, CN, NO₂, OH, C₁-C₆haloalkyl, C₂-C₆alkenyl, C₂-C₆haloalkenyl, C₃-C₆alkynyl, C₃-C₆alkoxy, C₁-C₆haloalkoxy, C₂-C₆alkenyloxy, C₂-C₆haloalkenyloxy, C₃-C₆haloalkynyloxy, C₁-C₆haloalkynyloxy, C₁-C₆alkylcarbonyl, C₁-C₆haloalkylcarbonyl, C₁-C₆alkylthio, C₂-C₆alkenylthio, C₃-C₆alkynylthio, C₁-C₆alkylthio, C₃-C₆haloalkynyl, C₁-C₆alkylthio, C₁-C₆alkoxy-C₁-C₆alkyl, NH₂, NH(C₁-C₆alkyl), N(C₁-C₆alkyl)₂ wherein the two alkyl groups are independent of one another, C₁-C₆alkylcarbonylamino, C₁-C₆alkoxycarbonylamino and C₁-C₆alkylaminocarbonylamino;

R₁₀ is H, C₁-C₁₂alkył unsubstituted or substituted by from one to five identical or different substituents selected from halogen, CN, NO₂, OH, C₁-C₆alkoxy, C₁-C₆alkylthio, NH₂, NH(C₁-C₆alkyl), N(C₁-C₆alkyl)₂ and C₁-C₆alkylcarbonylamino; C₃-C₈cycloalkyl, C₂-C₆alkenyl, C₂-C₆alkynyl, aryl, heterocyclyl or benzyl, wherein the aryl, heterocyclyl and benzyl radicals are unsubstituted or, depending upon the possibilities of substitution, substituted by from one to five identical or different substituents selected from the group consisting of halogen, CN, NO₂, OH, SH, C₁-C₆alkyl, C₁-C₆haloalkyl, C₃-C₈cycloalkyl, C₁-C₆-alkoxy, C₁-C₆alkylcarbonyl, C₁-C₆alkylcarbonyl, C₁-C₆alkylcarbonyl, C₁-C₆alkylcarbonyl, C₁-C₆alkylcarbonyl-C₁-C₆alkyl, NH₂, NH(C₁-C₆alkyl), N(C₁-C₆alkyl)₂ wherein the two alkyl groups are independent of one another, C₁-C₆alkylaminocarbonyl-amino;

 R_{11} and R_{12} are each independently of the other H, C_1 - C_6 alkyl, C_1 - C_3 haloalkyl, C_1 - C_6 alkylcarbonyl, C_1 - C_6 alkylcarbonyl, C_3 - C_8 cycloalkyl, C_3 - C_8 cycloalkyl- C_1 - C_6 alkyl or C_3 - C_8 cycloalkylcarbonyl;

 R_{13} is H, C_1 - C_6 alkyl, C_2 - C_6 alkenyl, C_3 - C_6 alkynyl or C_1 - C_6 haloalkyl;

 R_{14} is H, C_1 - C_6 alkyl, C_2 - C_6 alkenyl, C_3 - C_6 alkynyl or C_1 - C_6 haloalkyl;

 R_{15} is H, C_1 - C_6 alkyl, C_2 - C_6 alkenyl, C_3 - C_6 alkynyl or C_1 - C_6 haloalkyl;

k is 0, 1, 2, 3 or 4;

m is 1 or 2; and

q is 0, 1 or 2;

or, where applicable, a possible E/Z isomer, E/Z isomeric mixture and/or tautomer thereof, in each case in free form or in salt form.

- 2. The compound according to claim 1 wherein M is NOR₆,
- 3. The compound according to claim 1 wherein M is O.
- 4. The compound according to any one of claims 1 to 3 in free form.
- 5. A compound according to any one of claims 1 to 4 wherein X_1 and X_2 are chlorine or bromine.
 - 6. A compound according to any one of claims 1 to 5 wherein D is CH.
- 7. A compound according to any one of claims 1 to 6 wherein A_3 is straight-chain alkylene bridge.
- 8. A compound according to any one of claims 1 to 7 wherein R_5 is C_1 - C_{12} alkoxy- C_1 - C_{12} alkyl.
 - 9. A compound according to any one of claims 1 to 7 wherein $R_{\mbox{\scriptsize 5}}$ is heterocyclyl.
- 10. A pesticidal composition which comprises as active ingredient at least one compound defined in any one of claims 1 to 9, in free form or in agrochemically acceptable salt form, and at least one adjuvant.
- 11. A method of controlling pests which comprises applying a pesticidal composition as defined in claim 10 to the pests or to the locus thereof.